

Application No. 10/530,374
May 10, 2006
Reply to the Office Action dated December 13, 2005
Page 3 of 10

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-7 (canceled).

Claim 8 (previously presented): A method of producing a ceramic multi-layer substrate comprising the steps of:

preparing a composite laminate including an unfired ceramic laminate formed by laminating of a plurality of substrate ceramic green sheets, and a shrink-prevention ceramic green sheet arranged on at least one of the main surfaces of the unfired ceramic laminate, the shrink-prevention ceramic green sheet having a sintering temperature that is greater than the firing temperature of the unfired ceramic laminate;

firing the composite laminate at a temperature at which the unfired ceramic laminate is fired and which is less than the sintering temperature of the shrink-prevention ceramic green sheet; and

removing the shrink-prevention ceramic green sheet from the fired composite laminate; wherein

the step of removing the shrink-prevention ceramic green sheet includes:

a first removing step of spraying a liquid material and compressed gas against the shrink-prevention ceramic green sheet on the main surface of the composite laminate subjected to the firing step; and

a second removing step of spraying ceramic powder, a liquid material, and compressed gas against the main surface of the ceramic multilayer after the first removing step.

Application No. 10/530,374

May 10, 2006

Reply to the Office Action dated December 13, 2005

Page 4 of 10

Claim 9 (previously presented): The method of producing a ceramic multi-layer substrate according to Claim 8, wherein the step of removing the shrink-prevention ceramic green sheet includes a third removing step of supersonic-cleaning the ceramic multilayer substrate after the first and second removing steps.

Claim 10 (previously presented): The method of producing a ceramic multi-layer substrate according to Claim 8, wherein the step of removing the shrink-prevention ceramic green sheet further includes a third removing step of spraying a liquid material and compressed gas against the main surface of the ceramic multi-layer substrate after the first and second removing steps.

Claim 11 (previously presented): The method of producing a ceramic multi-layer substrate according to Claim 8, wherein the pressure of the compressed gas in the first removing step is in the range of about 147 kPa to about 539 kPa.

Claim 12 (previously presented): The method of producing a ceramic multi-layer substrate according to Claim 8, wherein the pressure of the compressed gas in the second removing step is in the range of about 98 kPa to about 343 kPa.

Claim 13 (previously presented): The method of producing a ceramic multi-layer substrate according to Claim 8, wherein the average particle size of the ceramic powder in the second removing step is in the range of about 9.5 μm to about 40 μm .

Claim 14 (previously presented): The method of producing a ceramic multi-layer substrate according to Claim 9, wherein in the third removing step, the ceramic multi-layer substrate is supersonic-cleaned under the conditions of a frequency of about 40 kHz to about 100 kHz and an output of about 0.2 W/cm² to about 2.0 W/cm².

Application No. 10/530,374

May 10, 2006

Reply to the Office Action dated December 13, 2005

Page 5 of 10

Claim 15 (previously presented): The method of producing a ceramic multi-layer substrate according to Claim 10, wherein the gas of the compressed air in the third removing step is in the range of about 147 kPa to about 539 kPa.

Claim 16 (previously presented): The method of producing a ceramic multi-layer substrate according to Claim 8, wherein the composite laminate includes at least one conductive layer disposed between respective ones of the plurality of substrate ceramic green sheets.

Claim 17 (previously presented): The method of producing a ceramic multi-layer substrate according to Claim 8, wherein the compressed gas in the first removing step is compressed air.

Claim 18 (previously presented): The method of producing a ceramic multi-layer substrate according to Claim 8, wherein the liquid material in the first removing step is water.

Claim 19 (previously presented): The method of producing a ceramic multi-layer substrate according to Claim 8, wherein the compressed gas in the second removing step is compressed air.

Claim 20 (previously presented): The method of producing a ceramic multi-layer substrate according to Claim 8, wherein the liquid material in the second removing step is water.

Claim 21 (previously presented): The method of producing a ceramic multi-layer substrate according to Claim 9, wherein in the third removing step, the composite laminate is set in a cleaning basket so as to stand upright.

Application No. 10/530,374
May 10, 2006
Reply to the Office Action dated December 13, 2005
Page 6 of 10

Claim 22 (previously presented): The method of producing a ceramic multi-layer substrate according to Claim 21, wherein in the third removing step, supersonic waves are irradiated into a cleaning liquid disposed on the cleaning basket by a supersonic wave vibrator.

Claim 23 (previously presented): The method of producing a ceramic multi-layer substrate according to Claim 22, wherein the cleaning liquid is one of a methylene chloride aqueous solution and a trichloroethylene aqueous solution.

Claim 24 (previously presented): The method of producing a ceramic multi-layer substrate according to Claim 10, wherein the liquid material in the third removing step is water.

Claim 25 (previously presented): The method of producing a ceramic multi-layer substrate according to Claim 10, wherein the compressed gas in the third removing step is compressed air.

Claim 26 (new): The method of producing a ceramic multi-layer substrate according to Claim 8, wherein the pressure in the second removing step is less than the pressure in the first removing step.